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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,176	10/22/2003	James P. Siepmann	LTI.PAU.04	8354

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EXAMINER	
PHAN, HANH	
ART UNIT	**PAPER NUMBER**
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/692,176	SIEPMANN, JAMES P.	
	Examiner	Art Unit	
	Hanh Phan	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☒ Claim(s) *18-20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasson (US Patent No. 6,967,977).

Regarding claims 1, 9 and 17, referring to Figures 1A, 1B, 2, 3A, 3B and 4, Hasson teaches in an optoelectronic timing system, an adaptive frequency generator system comprising:

at least one semiconductor laser (i.e., laser source 11, Figs. 1A and 2) configured to issue optical pulses defining a periodic pulse train (i.e., col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50);

at least a first optical waveguide (i.e., Figs. 1A and 2), the waveguide configured to define a first time-quantifiable optical path for a pulse of the train (i.e., col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50);

at least one additional optical waveguide (i.e., Figs. 1A and 2), the additional waveguide configured to define a second time-quantifiable optical path for a pulse of the train different from the first waveguide (i.e., col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50);

a first nodal point (i.e., Figs. 1A and 2) coupled to the first and second waveguides at which pulses of the train are directed into the first and second waveguides (i.e., col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50);

a second nodal point (i.e., Figs. 1A and 2) coupled to the first and second waveguides at which pulses directed into the first and second waveguides are recombined (i.e., col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50); and

wherein, the length of the second time-quantifiable optical path has a defined numerical relationship to the length of the first time-quantifiable optical path, such that the periodicity of pulses recombined at the second nodal point has the same numerical relationship with the periodicity of the issued pulse train (i.e., Figs.1A and 2, col. 3, lines 12-67, col. 4, lines 1-67, col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50).

Hasson differs from claims 1, 9 and 17 in that he does not specifically teach a laser configured to issue subnanosecond optical pulses defining a periodic pulse train. However, Hasson teaches that with the growing applicability of optical communications systems, particularly TDM systems, there has been a concurrent increase in demand for optical pulse generators capable of increasingly rapid repetition rates. Presently, optical pulse generators with repetition rates in the GigaHertz range are known (i.e., col. 1, lines 45-52). Therefore, it would have been obvious to obtain a laser configured to issue subnanosecond optical pulses defining a periodic pulse train in order to provide an optical pulse train generator with high repetition rate, since it has been held that where

the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re A11er, 105 USPQ 233.*

Regarding claims 2 and 10, Hasson further teaches the at least one semiconductor laser is configured to provide a pulsed output having a periodicity in the range of about 1 nanosecond so as to define a 1 gigahertz pulse train (i.e., col. 1, lines 45-52).

Regarding claims 3, 7, 11 and 15, Hasson teaches all the aspects of the claimed invention as set forth in the rejection to claim 1 above except fails to specifically teach the second optical time-quantifiable optical path has a length differing from the first time-quantifiable optical path by about 0.5 nanoseconds, so as to define a 2 gigahertz pulse train at the second nodal point or the lengths of the multiplicity of time-quantifiable optical paths differ from one another by about 0.2 nanoseconds, so as to define a 5 gigahertz pulse train at the second nodal point. However, Hasson teaches that the length of each step or the step-length facet, e.g., 16-1, may be tuned by the application of a tuning voltage. Additionally, in this way the delay structure 12 may be tuned to produce differing repetition rates for continuous trains or grouped series of subpulses (i.e., col. 7, lines 4-50). Therefore, it would have been obvious to obtain the second optical time-quantifiable optical path has a length differing from the first time-quantifiable optical path by about 0.5 nanoseconds, so as to define a 2 gigahertz pulse train at the second nodal point or the lengths of the multiplicity of time-quantifiable optical paths differ from one another by about 0.2 nanoseconds, so as to define a 5 gigahertz pulse train at the second nodal point in order to provide a higher optical timing frequency,

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re A11er, 105 USPQ 233.*

Regarding claims 4 and 12, Hasson teaches further comprising: a multiplicity of additional optical waveguides each coupled to the first and second nodal points, the additional waveguides configured to define a multiplicity of time-quantifiable optical paths; and wherein, the lengths of each of the multiplicity of additional time-quantifiable optical paths having a numerical relationship with each other and with the first time-quantifiable optical path (i.e., Figs.1A and 2, col. 3, lines 12-67, col. 4, lines 1-67 and col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50).

Regarding claims 5 and 13, Hasson further teaches the semiconductor laser is configured to provide a pulsed output at a first periodicity and wherein the recombined pulse train at the second nodal point provides a pulse train having a second periodicity, the second periodicity being a multiple of the first, the multiple defined by the numerical relationship between the multiplicity of additional time-quantifiable optical paths and the first time-quantifiable optical path (i.e., col. 4, lines 5-10 and col. 7, lines 4-50).

Regarding claims 6 and 14, Hasson further teaches the semiconductor laser operates at a frequency of about 1 gigahertz (i.e., col. 1, lines 45-52 and col. 4, lines 4-50).

Regarding claims 8 and 16, Hasson further teaches the time quantification of the optical path length is defined by the distance required for a pulse to travel at the speed

of light for a given time interval (i.e., Figs.1A and 2, col. 3, lines 12-67, col. 4, lines 1-67 and col. 5, lines 1-44, col. 6, lines 32-67 and col. 7, lines 1-50).

Allowable Subject Matter

3. Claims 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Liedenbaum et al (US Patent No. 5,691,832) discloses coherent multiplexed transmission system.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

HANH PHAN
PRIMARY EXAMINER